

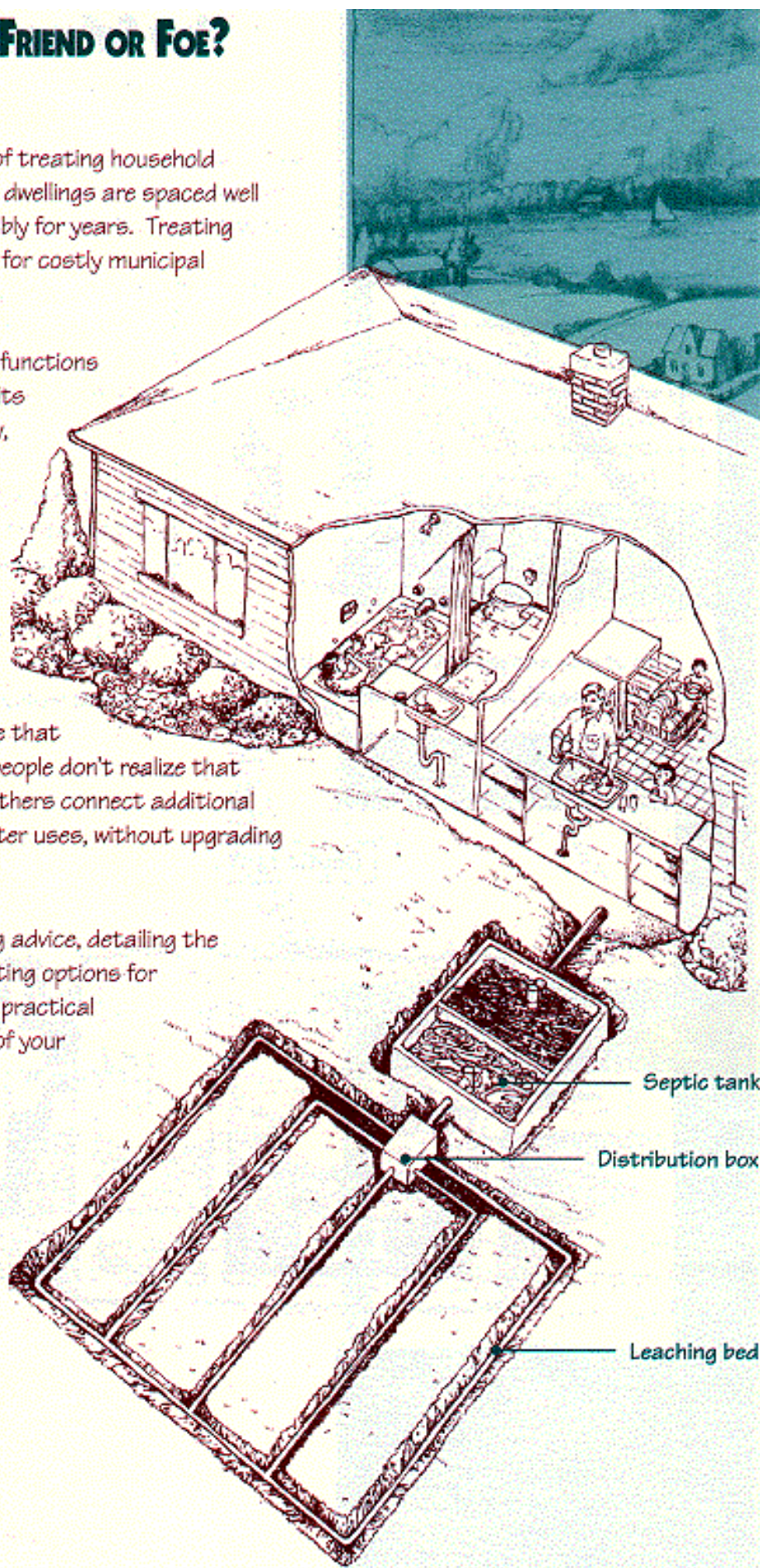
## YOUR SEPTIC SYSTEM – FRIEND OR FOE?

A septic system is an excellent means of treating household wastewater. On proper soils, and where dwellings are spaced well apart, septic systems can operate reliably for years. Treating sewage on-site, they eliminate the need for costly municipal sewers in rural areas.

Septic systems can also fail. Many malfunctions are investigated by Ontario's Health Units and Ministry of Environment and Energy, every year. They are often public health and environmental hazards and can also be very costly to repair. Many of these problems could easily have been prevented.

Problems with septic systems often stem from improper use. A surprising percentage of householders don't realize that they are using a septic system. Many people don't realize that ongoing maintenance is required. Still others connect additional toilets, showers, hot tubs and other water uses, without upgrading their septic system.

This manual can help. Offering operating advice, detailing the maintenance requirements, and suggesting options for septic systems in need of repairs, it's a practical guide to day-to-day "care and feeding" of your on-site treatment system.



# HOW SHOULD A SEPTIC SYSTEM WORK?

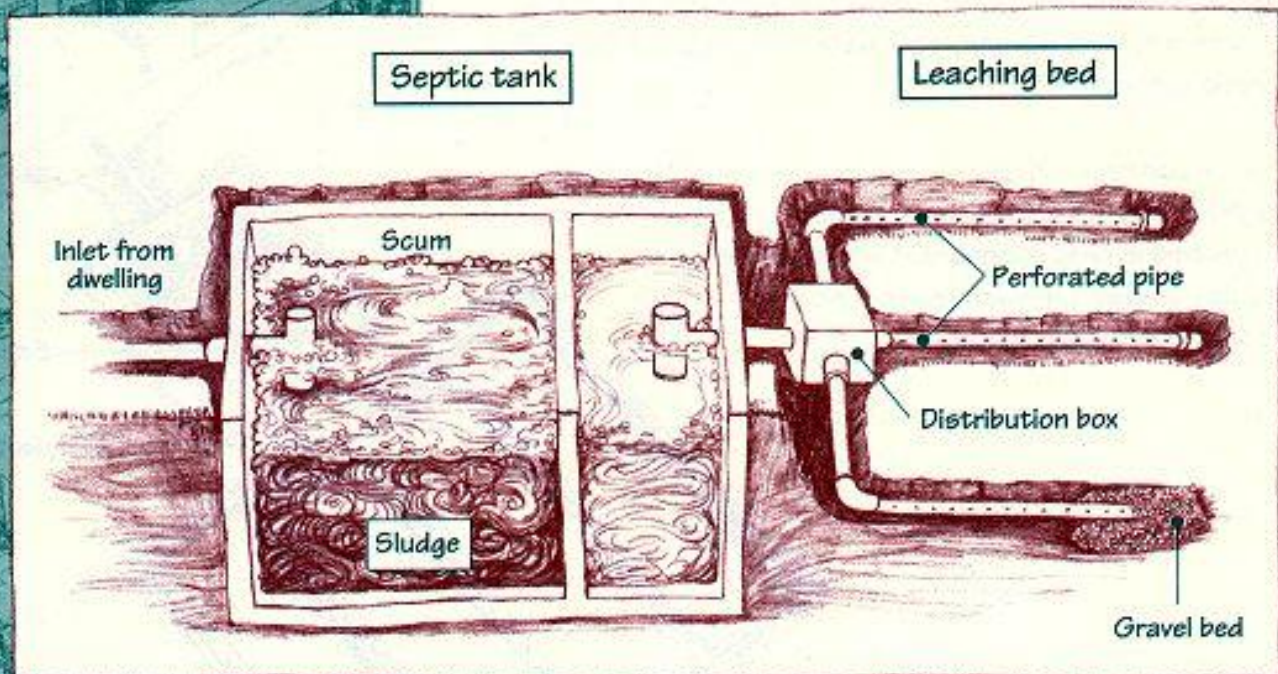
Buried in your yard and built to last, your home septic system may never have crossed your mind. But out of sight and out of mind, it still performs a vital task.



A bit of care and preventive maintenance helps keep your septic system healthy and happy.

It's simple: a tank, a network of pipes and billions of microscopic organisms. Yet it's received every flush, every shower, and whatever else you and anyone else who's lived in your house has ever poured down the drain.

Your septic system treats tonnes of organic waste each season. The tank treats sewage by letting the heavy solid materials settle and allowing time for lighter "scum" to float to the top. This partly treated liquid then flows into perforated pipes, called the leaching bed, where it filters into the ground and is further treated. Helpful bacteria and other soil organisms do the bulk of the work.



## WHAT GOES WRONG?

Over time, a septic tank accumulates solid material, which must be pumped out. Allowed to accumulate, this sludge may reach the outlet level and begin flowing into the leaching bed. There, it can plug the pipes or the bed.

Over the years, many septic systems are subject to increased usage. Some were built for small homes or cottages, and were not enlarged as additions were made. The new volumes of water strain the septic system, and it eventually gives up.

Fortunately, regular septic maintenance and moderate water use can prevent these problems. And a bit of forward thinking when sizing and installing the system can allow some extra capacity to meet future needs. Bigger is better, and more capacity can mean a longer service life.

### What happens when a septic system malfunctions?

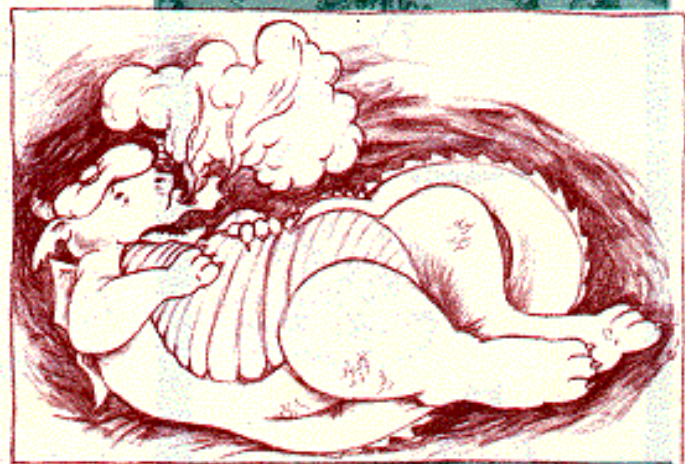
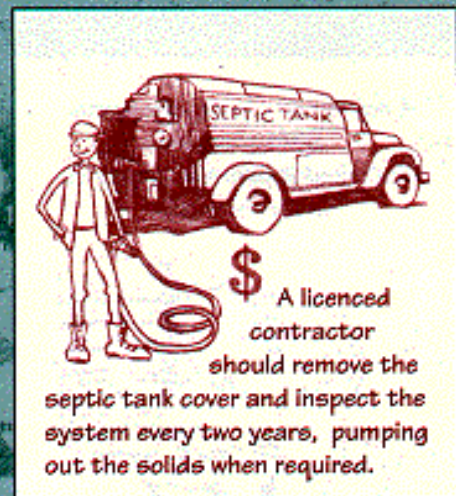
Plenty. A clogged septic system can be hazardous to the environment and to your pocketbook. It can degrade water supplies and reduce your property value.

The required repairs can be messy, often involving excavation and replacement of the whole drainage field. Frequently, the local Public Health Unit will require replacement of the entire system and any damaged landscaping.

### What are the symptoms of an ailing septic system?

Warning signs range from subtle to insufferable. The grass over the system may become unusually green or spongy to walk on. Toilets, showers and sinks might take longer to drain. Occasional sewage odours may become noticeable, often after a rainfall. Sometimes, homeowners discover gray or black liquids surfacing in their yards, or backing up through fixtures into the house.

Whatever the warning sign, it pays to fix it fast. A call to the contractor now, can save big bucks, later.



**!** Malfunctioning Septic Systems are a concern across Ontario.

- The Ontario Ministry of Environment and Energy investigates thousands of neglected systems each year.
- Remediation can cost up to \$25,000 per system.
- Maintenance, and water conservation, can prevent problems.

## OPERATING YOUR SEPTIC SYSTEM

A regular diet is all your septic system needs. Don't feed it garbage, grease or nasty chemicals.



No Diapers

No paints or solvents



No bleach or strong cleaning agents

Garburators strain a septic system. Save your kitchen waste for your composter outside.



### If in doubt — don't pour it out!

Septic systems thrive on wastewater, but certain chemicals can cause major indigestion. Flushing even small amounts of paints, solvents, thinners, nail polish remover and other common household compounds (or pouring them down the drain) can poison the organisms that break down organic material.

Laundry bleaches, toilet bowl cleaners and caustic drain openers can also slow the treatment process, allowing sewage to pass through without proper treatment. And often, the chemicals themselves seep into the ground, sometimes contaminating wells or surface waters.



Septic systems cannot digest oils, grease and fat.

Poured down the sink or toilet, they congeal in pipes, sometimes plugging them. Grease can also combine with detergents and flow into the drainage field where it may clog the soils. Fats can form a blob in the top of the tank, and interfere with the biological activities taking place. All oily waste should go out with the garbage.

### Mr. Grease

Using your septic system to dispose of garbage is another no-no. In-sink garbage disposals ("Garburators") are unwelcome strains on the system. Disposable diapers, tampons and their holders, condoms, wrappers and many other kinds of refuse can plug and impair septic systems. If something doesn't break down naturally, don't flush it into your septic tank.

Preparations marketed as septic tank "cleaners," "starters" or "enhancers" are of little value. Some have led to essential bacteria in the tank perishing, and others may flush septic solids into the drainage field. At best, these products are entirely unnecessary.

## YOUR DRINKING WATER DEPENDS ON A HEALTHY SEPTIC SYSTEM

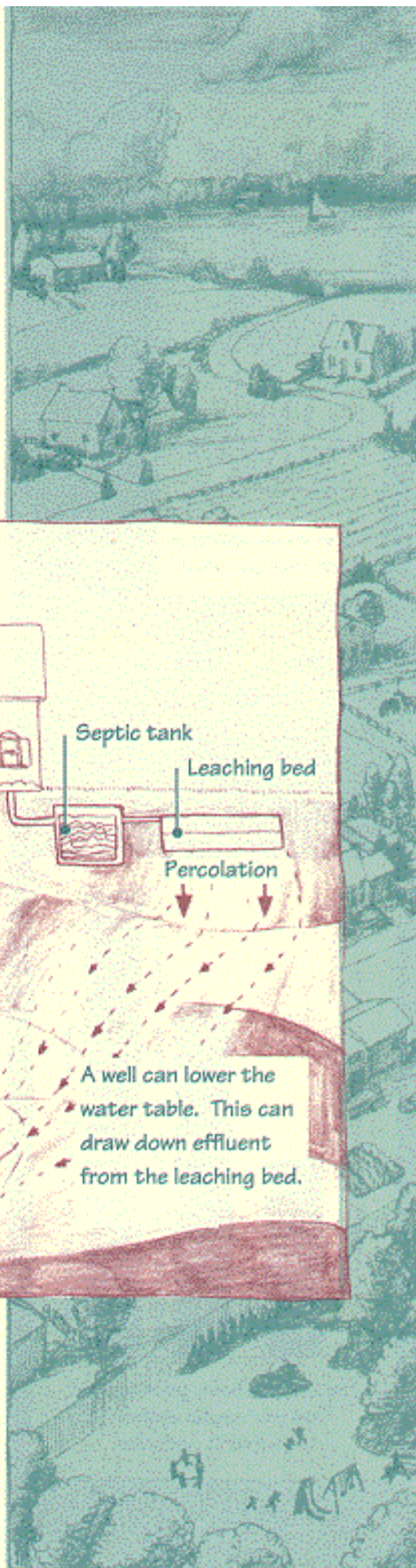
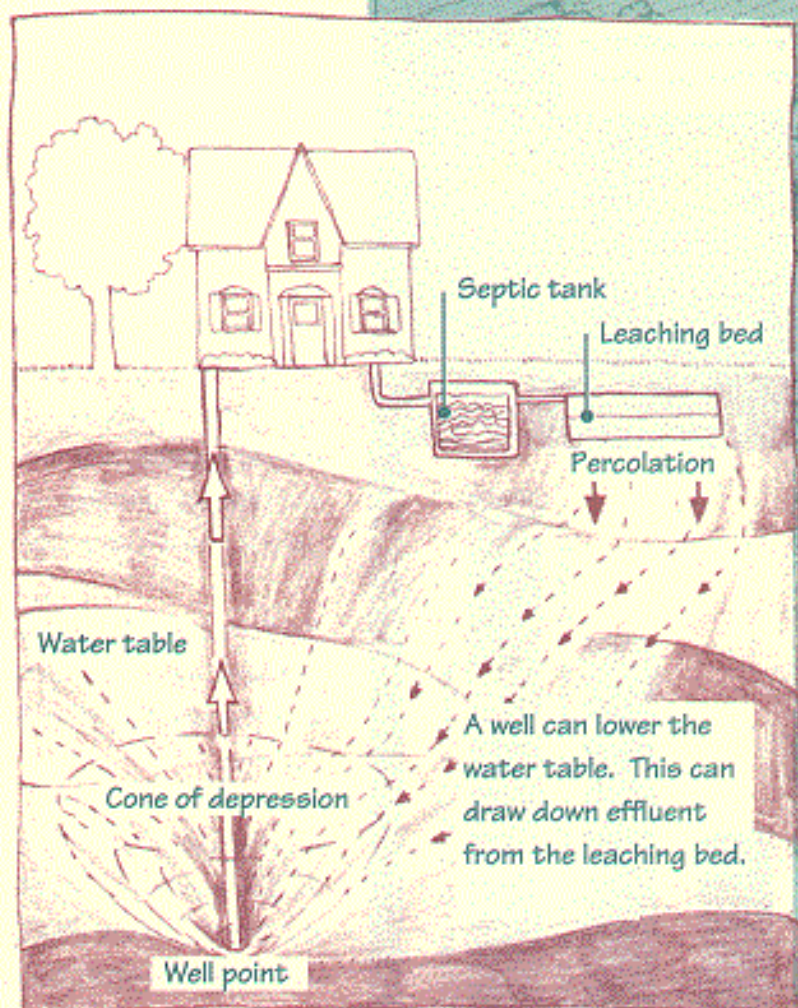
A septic system does some heavy-duty digestion. Viruses, bacteria and organic material are just some of the nasty things that it has to work on. And if not treated, they can travel a long way underground. If they flow into drinking water supplies, these organisms and compounds can cause diseases or other health or environmental problems.

Some components of sewage are very mobile once they enter the soil. And across the province, nitrate contamination of wells is already a concern for thousands of households.

To make matters worse, as a well draws groundwater toward itself, it also creates a funnel-shaped depression in the water table around it. This "cone of depression" may encourage septic effluent to follow a downward or lateral path toward the well. A household's well water, even if it's been good for years, can suddenly contain dangerous contaminants.

The less your well pumps, the less it tends to draw septic effluent and other contaminants toward it. And looking down the road, properly functioning septic systems help protect the quality of your community's drinking water. Careful water use also extends the life of your septic system and helps it work better.

By conserving water, you lessen the odds of your water supply becoming contaminated. Maintaining your septic system helps protect your well—and your neighbour's.



## How Much Goes Down the Drain?



Water conservation is easier than you think.

Septic systems are by nature, slow-moving creatures. They work slowly, because the micro-organisms that treat wastewater can only digest so much at a time. Septic tanks also need some "retention time" for the solids to separate from the liquids.

This means that pouring less into your septic system allows it more time to work on each litre of waste, and each litre will be more completely treated. It also means that pushing too much, too quickly through your septic tank can cause untreated solid material to flow into the drainage field, possibly clogging it.

Even if the pipes aren't blocked, treatment won't be adequate because solids have missed their chance to be broken down in the tank. Instead, they are discharged to the ground while still containing dangerous bacteria, viruses and pollutants in unacceptable concentrations.

Up to 200 litres of water are discharged to your system with each load of laundry and ordinary toilets use up to 20 litres per flush. So, too many loads of laundry in a day, or the extra toilet flushing from a party can load a septic tank with several times its usual daily flow. House guests, and the extra demands they place on your septic system are another concern. Older systems, often designed with smaller tanks and drainage fields, are especially vulnerable.

Fortunately, it's easy to use water wisely throughout the house. Whether washing vegetables, cleaning dishes, brushing your teeth or shaving, use the plug and water in the sink to avoid leaving the taps running.

Keep showers short and to the point. Run dishwashers and clotheswashers only when full, and use the cycles with the lowest number of rinses. Try to spread the clothes washing over several days. And when buying appliances, compare their water usage rates.

A tap leaking just one drop per second wastes about 10 000 litres of water per year. A silently leaking toilet can waste up to 20 times that amount. Day and night, water is pumped from your well, through your septic system –and all for naught! Since most leaks are easy to find and fix, water saving starts with stopping the drips.

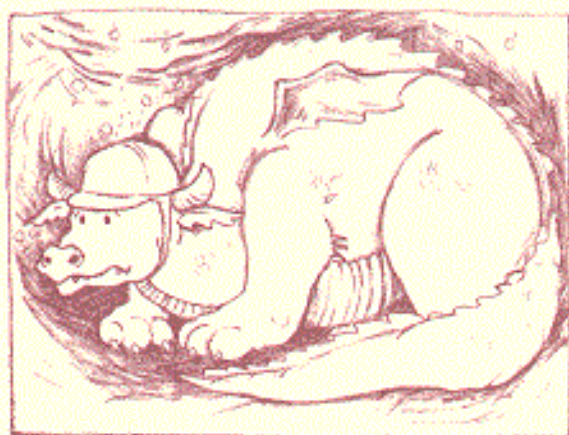


The less you flush, pour or drain into your septic system, the better it performs.

## PROTECTING YOUR SEPTIC SYSTEM

Driving cars or machinery over your septic system will crush it. The soil surrounding the pipes may also be compacted, making it less adept at absorbing sewage flows. Snowmobiles compress the snow cover over the field, reducing its natural insulating effect and increasing the risk of pipes freezing.

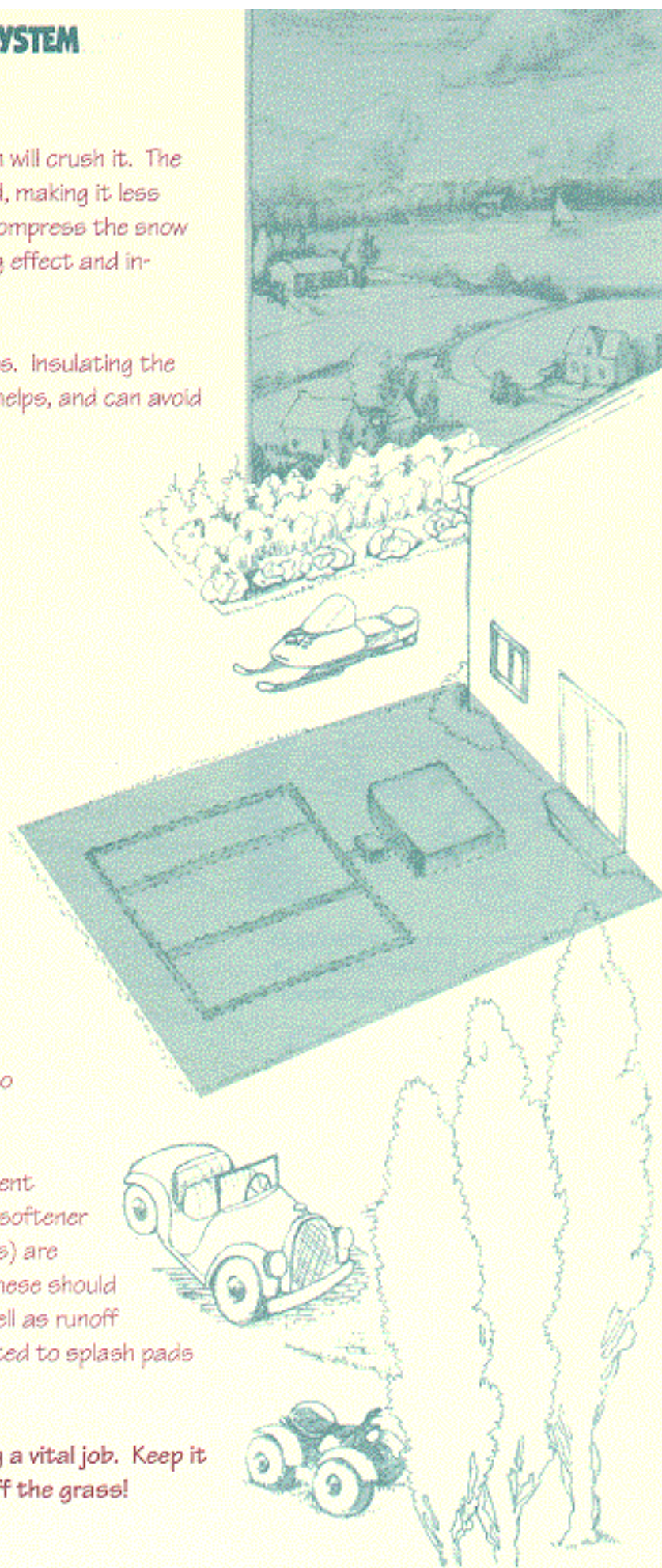
Septic tanks work better at warmer temperatures. Insulating the top of the tank (eg. with polystyrene insulation) helps, and can avoid sewage freezing under extreme conditions.



Planting trees and shrubs (especially willows and poplars) near the field is risky, because their roots travel significant distances to seek water and can plug or damage the pipes. And watering of the grass over the field, whether by inground systems or by hand, should be eliminated or minimized. Watering interferes with the soil's ability to absorb liquids and break down wastes.

Discharged waste flows from home water treatment units, furnace condensate discharges and water softener backwash (which may contain salt concentrations) are strains that your septic system doesn't need. These should go to leaching pits. Likewise, building sumps, as well as runoff from roofs, patios and driveways, should be directed to splash pads away from the tank and leaching bed.

**The drainage field is a specialized system, doing a vital job. Keep it dry, don't plant near it and keep heavy things off the grass!**



## MAINTAINING YOUR SEPTIC SYSTEM 'SLUDGE HAPPENS'

Even on a proper diet, a septic system still needs regular check-ups. Though a septic tank is designed to store solid materials, these solids build up and limit the settling of particles entering it. And if septic solids are allowed to flow into the drainage field, the field may become clogged.

Sludge decreases the retention time in your tank — though it appears to be working normally. It might take a year, or it may take five or more, but 'sludge happens'.

The smaller the tank, and the more people using it, the faster the sludge accumulates — and though larger tanks have more capacity, these too will eventually fill. Once it's too late, you'll **know** your drainage field is too congested to do its job. Your drains and toilets slow down, stop, or may even start to run backwards.

Having your septic tank inspected every two years is cheap insurance.

It costs less, per year, than the sewer charges levied in many urban areas. And gives you the confidence that your tank has its whole design capacity ready to treat your household's wastewater.

Summer, and early fall are the best times to pump out your septic system. This leaves time before winter, for the tank to refill and for bacterial action to become re-established. Also, the ground won't be frozen, and the spring water table, which can create buoyancy problems for septic tanks, has receded. Particular care should be taken when pumping tanks made of lightweight materials such as polyethylene, fibreglass and steel.

A septic system pump-out is less than a hundredth the price of an overhaul.

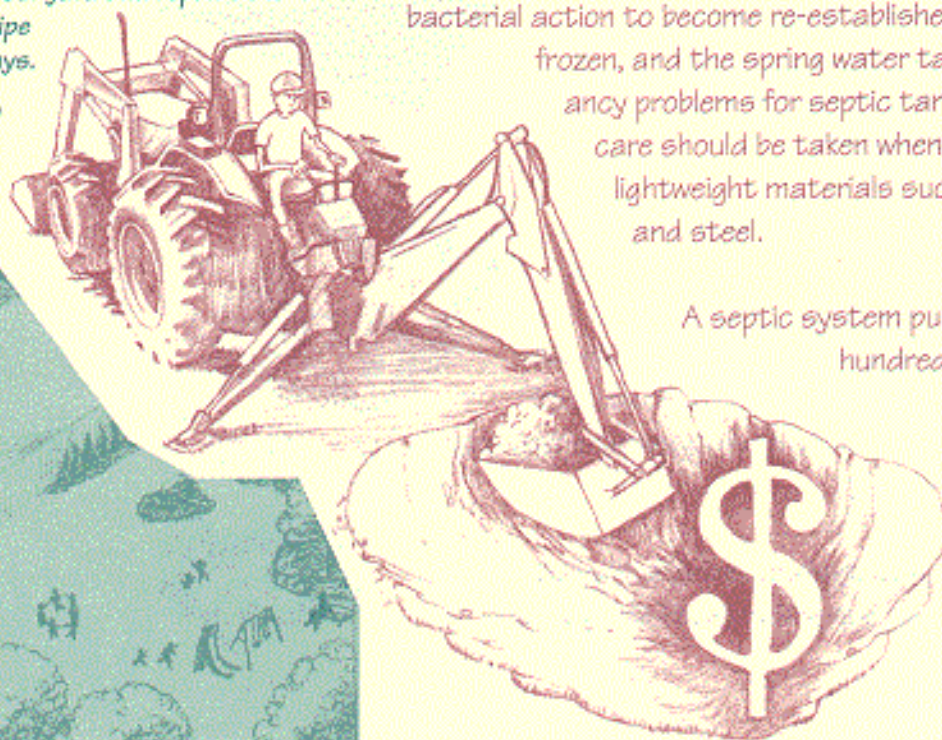
So the choice is yours.  
Pay a little now...or a lot,  
later!



A cross-section shows settled solids and floating scum decreasing the tank's available capacity.



A licenced contractor can pump the solids from your septic tank in under an hour. Or, he can dig up your yard and repair dozens of metres of pipe — over a few days.





## WHAT TO DO WHEN THERE'S A PROBLEM

When your drains slow down, or toilets back up, its time for immediate action.

You are required by law to report any problem to your local Health Unit, before proceeding with repairs. Once Health Unit approval has been obtained, call a licenced contractor. Detail the full extent of the problem, giving specific details as to when you first noticed any symptoms.

Repairs can range from clearing a few lines, to replacing entire drainfields and landfilling contaminated soil. Costs vary from a few hundred dollars, to thousands.

The extent and cost of required repairs depends on how far you let the problem go.

## YOUR SEPTIC SYSTEM AND THE LAW

A privately-serviced home means independence. More than just no sewer bills, it's an opportunity to really 'live off the land' – off your land – without relying on someone else to take care of your waste.

A septic system is also a responsibility. Neglected or over-used, your septic system may affect your water supply and the wells in your community.

Where a failing septic system becomes a matter of public health, remediation is required by law.

All septic systems in Ontario are regulated by The Ontario Ministry of Environment and Energy, under the Environmental Protection Act. The E.P.A. requires that a Certificate of Approval be obtained, prior to the construction, installation, extension, enlargement or alteration of any sewer system, or any building connected to a sewer system. A Certificate of Approval is obtainable from your local Public Health Unit.

The E.P.A. also requires that a final inspection be carried out and a Use Permit granted, before using a new or altered septic system.



# ALTERNATIVE SEWAGE SYSTEMS



## Pumping Chambers

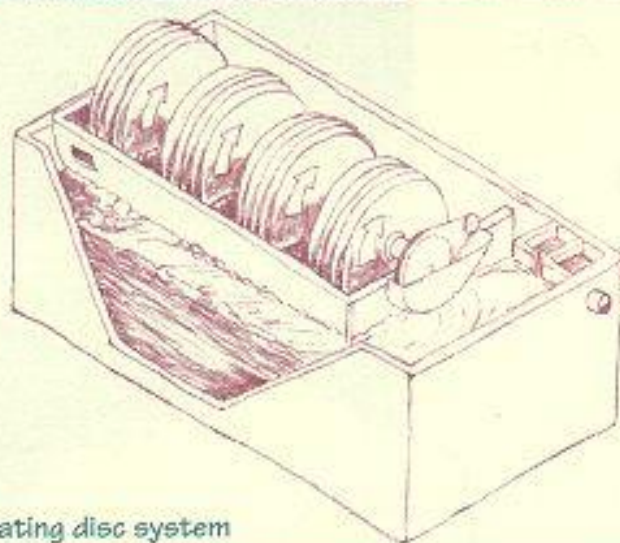
Many larger systems and systems with raised fields use a pump to carry effluent to the drainage field. Located in a separate chamber, these pumps eventually require maintenance or replacement.

## Holding Tanks

Some on-site systems are designed only to store wastewater, which is then pumped from the tank and trucked off-site for treatment. Often used where septic systems cannot be accommodated, these holding tank systems depend on an alarm to warn when nearly full, and usually require an on-going contract with a pumping service.

## Aerobic Systems

Several mechanical alternatives to septic systems are available on the market. These are active systems, using compressors or motors to introduce air into the treatment of wastewater. Most of these systems bubble air through wastewater, or use rotating discs to expose the sewage to air.

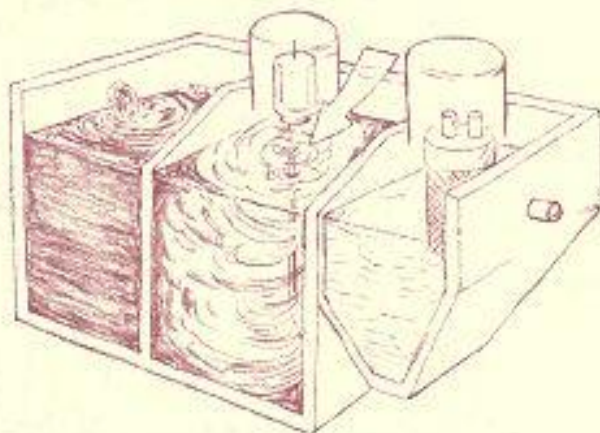


Rotating disc system

By contrast, a septic system, unless it uses a pump to discharge to the leaching bed, has no moving parts and requires no electricity.

Aerobic systems can provide a higher level of treatment than standard septic tanks. They also require lubrication, electrical connections and more frequent maintenance than conventional septic.

Some local Health Departments have been hesitant to approve these designs, because of problems that have arisen from improperly maintained systems; the same size drainage field may be required for an aerating system as for a standard septic system.



Rotor aeration system

## New Technology

These systems are improving as new technologies are further developed and demonstrated. Research into improved mechanical systems, better biological treatment media and systems using wetland or aquatic plants appears very promising. The University of Waterloo's Centre for Groundwater Research is one of the leaders in this research.

Call your Health Department for information on what kind of systems may be considered for approval in your area.

## THE BOTTOM LINE...

Proper care and feeding of your septic system couldn't be easier. Fix all the leaks, be frugal with your water and do not flush chemicals, garbage and grease.

Have your septic system checked at least every two years and pumped, when required.

Lastly, keep a maintenance schedule on your septic system — refer to the back cover for a sample format. Record the physical layout of the system, the dates it was inspected, the kind of work done, and the name of the licenced contractor who performed the work.

**Remember... a well maintained septic system can run for decades. An abused or neglected one can fail tomorrow.**

### Further Information

Ontario Ministry of Environment  
and Energy Offices:  
Central Region  
7 Overlea Blvd., 4th Floor  
Toronto, M4H 1A8  
Tel.: (416) 424-3000

Northern Region  
Thunder Bay Regional Office  
P.O. Box 5000  
3rd. Floor, 435 James St. South  
Thunder Bay, P7C 5G6  
Tel.: (807) 475-1205

Mid-Ontario Region  
Sudbury Regional Office  
199 Larch St.  
Sudbury, P3E 5P9  
Tel.: (705) 675-4501

Southwestern Region London  
Regional Office  
985 Adelaide St. South  
London, N6E 1V3  
Tel.: (519) 661-2200

West Central Region  
Hamilton Regional Office  
Ontario Government Building  
119 King St. West  
12th Floor, Box 2112  
Hamilton, L8N 3Z9  
Tel.: (905) 521-7640

Southeastern Region  
Kingston Regional Office  
133 Dalton St.  
Kingston, K7L 4X6  
Tel.: (613) 549-4000

Local Public Health Units — Look under 'Public Health' in the Municipal Governments section in your telephone directory.

Licensed Septic System Contractors and Manufacturers — look under 'Septic' in the "Yellow Pages" section of your telephone directory. Or ask your local Public Health Unit.

The Concrete Precasters Association of Ontario  
— P.O. Box 278, Marmora, Ontario, K0K 2M0. Tel. (613) 472-6039.



### Further Reading

Ministry of Environment and  
Energy Publications:

Septic Tank Systems,  
Summer 1990

Home Water Treatment Devices

Environmental Living: Protecting  
The Environment — Volumes 1 to 5

Other Publications  
Environment Canada:

Water Conservation - Every Drop  
Counts

Water - No Time to Waste